



FILED

05/08/20
04:59 PM

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE
STATE OF CALIFORNIA**

Order Instituting Rulemaking Regarding Policies,
Procedures and Rules for Development of
Distribution Resources Plans Pursuant to Public
Utilities Code Section 769.

Rulemaking 14-08-013
(Filed August 14, 2014)

And Related Matters.

A.15-07-002
A.15-07-003
A.15-07-006

(NOT CONSOLIDATED)

In the Matter of the Application of PacifiCorp
(U901E) Setting Forth its Distribution Resource
Plan Pursuant to Public Utilities Code Section 769.

A.15-07-005
(Filed July 1, 2015)

And Related Matters.

A.15-07-007
A.15-07-008

**PACIFIC GAS AND ELECTRIC COMPANY'S (U 39 E)
ICA IMPLEMENTATION UPDATE**

CHRISTOPHER J. WARNER

Pacific Gas and Electric Company
77 Beale Street, B30A
San Francisco, CA 94105
Telephone: (415) 973-6695
Facsimile: (415) 973-5520
E-Mail: Christopher.Warner@pge.com

Attorney for
PACIFIC GAS AND ELECTRIC COMPANY

Dated: May 8, 2020

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE
STATE OF CALIFORNIA**

Order Instituting Rulemaking Regarding Policies,
Procedures and Rules for Development of
Distribution Resources Plans Pursuant to Public
Utilities Code Section 769.

Rulemaking 14-08-013
(Filed August 14, 2014)

And Related Matters.

A.15-07-002
A.15-07-003
A.15-07-006

(NOT CONSOLIDATED)

In the Matter of the Application of PacifiCorp
(U901E) Setting Forth its Distribution Resource
Plan Pursuant to Public Utilities Code Section 769.

A.15-07-005
(Filed July 1, 2015)

And Related Matters.

A.15-07-007
A.15-07-008

**PACIFIC GAS AND ELECTRIC COMPANY'S (U 39 E)
ICA IMPLEMENTATION UPDATE**

Pursuant to D.17-09-026, Pacific Gas and Electric Company ("PG&E") provides this Integration Capacity Analysis ("ICA") implementation update to the California Public Utilities Commission ("Commission"), outlining steps that PG&E has taken to complete a system refresh of all valid circuits, as part of the effort to operationalize the Integrated Capacity Analysis ("ICA") map and to better incorporate quality control into the ICA process. The implementation update is attached as an appendix to this pleading.

Respectfully Submitted,
CHRISTOPHER J. WARNER

By: /s/ Christopher J. Warner
CHRISTOPHER J. WARNER

Pacific Gas and Electric Company
77 Beale Street, B30A
San Francisco, CA 94105
Telephone: (415) 973-6695
Facsimile: (415) 973-5520
E-Mail: Christopher.Warner@pge.com

Attorney for
PACIFIC GAS AND ELECTRIC COMPANY

Dated: May 8, 2020

APPENDIX

PG&E'S INTEGRATION CAPACITY ANALYSIS (ICA) IMPLEMENTATION UPDATE

MAY 8, 2020

Background

In December 2018, PG&E posted completed integration capacity analysis (ICA) results, as directed in D.17-09-026. This was the first time PG&E had completed a system-wide iterative ICA. PG&E filed a Completion Report on December 28th, 2018 that summarized the initial ICA.¹ Upon further examination of the initial results (which frequently showed low or no integration capacity), PG&E determined that a new systematic approach to a system refresh would likely improve the quality and comprehensiveness of results.

Summary of System Refresh

Beginning in 2019, PG&E worked with a third-party vendor, GridUnity, to operationalize ICA and incorporate intelligent quality control into the ICA process. GridUnity's Grid Model Management (GMM) software solution uses a combination of automated engineering rules and manage-by-exception business process flows that enable PG&E to systematically address data issues before initiating ICA for each circuit. Figure 1 provides an illustration of how ICA is at the center of the process, but is enabled by four preliminary steps—Model Intake, Sanity Check, Peak Load Allocation, and Hourly Load Allocation.² In addition to the project goals above, PG&E's and GridUnity's work on ICA and the GMM quality control process has resulted in 1) expansion of GridUnity's GMM capabilities, 2) improvements to PG&E's forecasting software, 3) improvements to PG&E's distribution power flow software and ICA algorithm, and 4) improvements to PG&E's Electric Distribution GIS.

¹ PG&E's ICA Completion Report Pursuant to Ordering Paragraph 9 of D.17-09-026, R.14-08-013, December 18, 2018.

² GridUnity's Grid Model Management (GMM) involves four steps. 1) Model Intake ingests PG&E's distribution model and automatically performs routine model-handling updates to prepare a circuit specifically for ICA. 2) Sanity Check performs situation-based model corrections, automates existing manual processes, and flags to engineers any corrections that cannot be addressed through the processing. 3) Peak Load Allocation checks for modeling errors identified after a peak load flow is performed. 4) Hourly Load Allocation performs time- and power flow-dependent steps for all 576 hours.

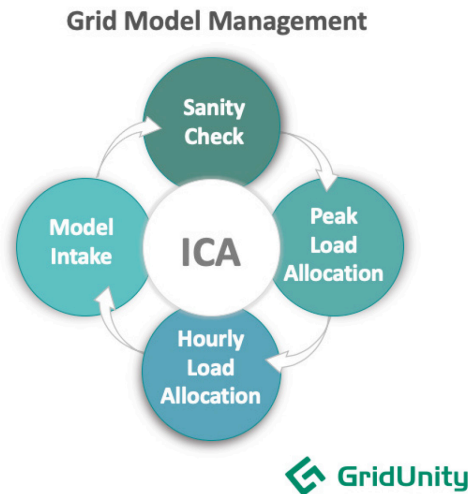


Figure 1 - GridUnity's Grid Model Management Software

Summary of Results

In order to operationalize ICA studies and better incorporate quality control into the ICA study process, PG&E re-analyzed all valid circuits, performing a system refresh using the GMM solution. As of April 2020, PG&E completed the refresh, and is now reporting increases in the posted integration capacity.

Figure 2 below provides a system-level illustration of how the reported integration capacity³ has increased following the implementation of the new data quality improvements. The figure shows a histogram of the distribution of line sections by their reported integration capacity. The results from before system refresh (as of December 2018) are shown in orange, with results after system refresh (April 2020) shown in blue. As shown on the left of the figure, 85% of the line sections on PG&E's distribution system had reported no available integration capacity before the system refresh. After the system refresh, only 45% of the line sections have reported no integration capacity. The right of the figure shows the trend of increasing integration capacity.

³ The integration capacity value shown in these figures is "Uniform Gen with OpFlex" as shown on the ICA maps, one of the five posted ICA values. The other ICA values had increases generally consistent with those shown for the "Uniform Gen with OpFlex".

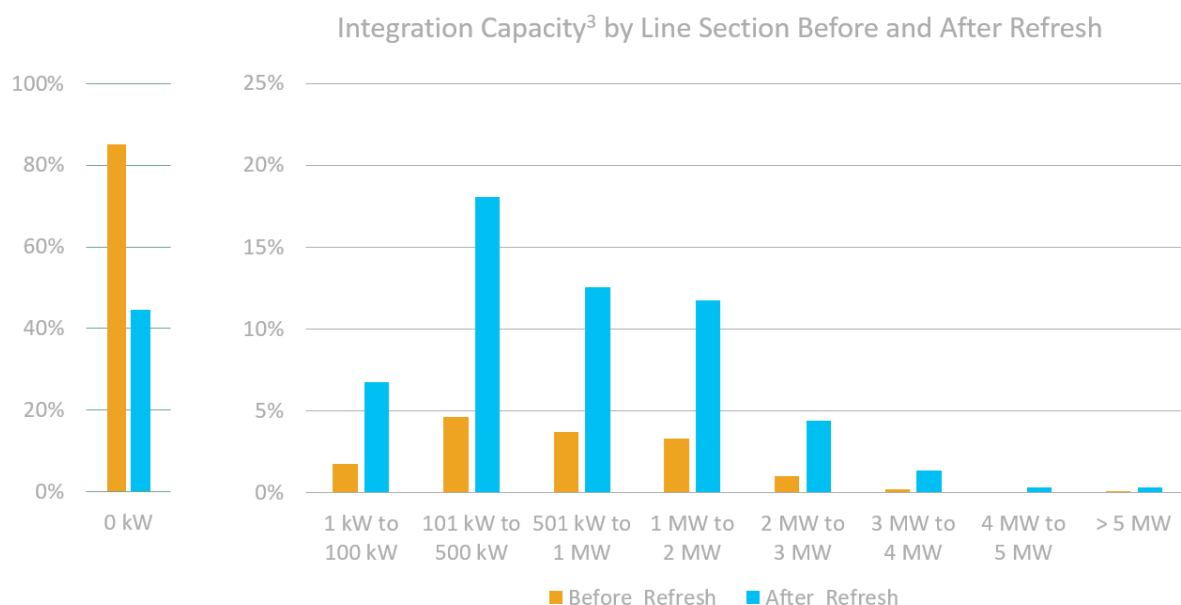


Figure 2 – Distribution of Line Section Results by Integration Capacity

In addition to reducing the number of line sections reporting no integration capacity, the reported integration capacity of line sections increased across the entire system. The process has resulted in the average reported integration capacity on each line section increasing by nearly 400%. Before the system refresh, the average reported line section integration capacity was 126 kW. After system refresh, the average reported line section integration capacity increased to 500 kW. The trend of increasing integration capacity is summarized in Figure 3.

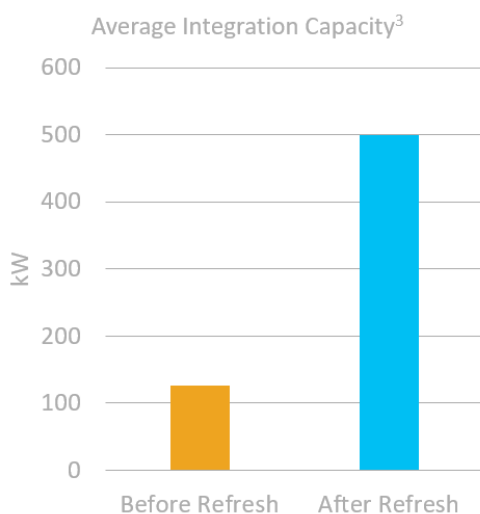


Figure 3 - System Average of Line Section Integration Capacity

Posting of ICA Results on Distribution Resource Planning (DRP) Portal

PG&E has analyzed all valid circuits with GridUnity and the results are now available on [PG&E's DRP Portal](#). Using data-based study triggers, the GMM system will continue to automatically analyze circuits on a monthly basis, with updated results to be published as they become available.

Updated ICA Implementation Costs

Table 1 shows an update on the ICA implementation costs. In 2018, PG&E spent \$1,290k on the initial implementation of ICA. In 2019 and 2020, PG&E spent \$3,240k and \$806k, respectively, working with GridUnity to perform the system refresh, operationalizing ICA and better incorporating quality control into the ICA process. In addition, this investment has resulted in the automation of future studies based on system changes such as new interconnections and distribution system changes. Going forward, PG&E anticipates spending \$2,500k annually for ongoing administration and monthly updates.

Table 1 - Historical and Forecasted ICA Implementation Costs

	2018 (\$1,000)	2019 (\$1000)	2020 (\$1000)	2021 (\$1000)	Total (\$1000)
Initial Implementation	\$1,290	\$0	\$0	\$0	\$1,290
System Refresh	\$0	\$3,240	\$806	\$0	\$4,046
Ongoing Administration and Monthly Updates	\$0	\$0	\$2,000	\$2,500	\$4,500
Total	\$1,290	\$3,240	\$2,806	\$2,500	